



**INDIANA  
MICHIGAN  
POWER**

**Indiana Michigan  
Power Company**  
Nuclear Generation Group  
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Bridgman, MI 49106  
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AEP-NRC-2009-30  
10 CFR 2.206

Docket No.: 50-315

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555-0001

Donald C. Cook Nuclear Plant Unit 1  
INPUT FOR RESPONSE TO UNION OF CONCERNED SCIENTISTS  
PETITION FILED PURSUANT TO 10 CFR 2.206

In a letter dated December 16, 2008 (ADAMS Accession No. ML083640201), the Union of Concerned Scientists submitted a petition under 10 CFR 2.206 requesting that the Nuclear Regulatory Commission (NRC) take enforcement action against Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant Unit 1. Specifically, the petition requested the NRC issue a Demand for Information requiring I&M to docket information associated with seismic qualification of plant structures and equipment following the Unit 1 main turbine vibration event of September 20, 2008. The attachment to this letter provides I&M's input for preparing a response to the subject request.

There are no commitments made in this response. Should you have any questions, please contact me at (269) 466-2478.

Sincerely,

John A. Zwolinski  
Regulatory Affairs Manager

JEN/rdw

Attachment

- c: T. A. Beltz – NRC Washington DC
- K. D. Curry - AEP Ft. Wayne, w/o attachment
- J. T. King – MPSC, w/o attachment
- MDEQ – WHMD/RPS, w/o attachment
- NRC Resident Inspector
- M. A. Satorius – NRC Region III

YE03  
NRC

ATTACHMENT TO AEP-NRC-2009-30

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**Question 1:**

**The vibration levels experienced in the control room, turbine building, and other structures during the September 20, 2008, event.**

**CNP Input:**

Vibration levels experienced in the control room, turbine building, and other structures were not measured or recorded during the September 20, 2008, vibration event involving the Unit 1 main turbine. Seismic monitoring instrumentation at CNP is triggered when the minimum threshold for vibration (i.e., minimum acceleration instrumentation setpoint) is reached. The seismic monitoring instrumentation was not triggered during the turbine vibration event of September 20, 2008, and therefore no data associated with the event was recorded. Based upon this information, CNP has concluded that the ground acceleration experienced by equipment within the Unit 1 Containment Building did not exceed a value of 0.02g (acceleration equivalent to 2% of that due to the force of gravity). Details of the seismic monitoring system at CNP are included below.

The seismic instrumentation system is described in the CNP Updated Final Safety Analysis Report (UFSAR), Section 1.1.4, and consists of a control panel with cassette-mounted tape recorders, a magnetic tape playback system, one horizontal and one vertical seismic trigger, four tri-axial accelerometers, and associated electronic equipment. The control panel is located in the main control room and features an event indicator which illuminates when the system is triggered. The magnetic tape playback system is also located in the main control room. One seismic trigger, known as the free-field trigger (away from influences of other structures), is located in a block house in the 345 kilovolts (kV) switchyard. This switchyard is located several hundred yards from the turbine building. The second seismic trigger is located in the bottom of the Unit 1 containment building and is the closest one to the Unit 1 turbine building. The triggers are actuated at 0.02g acceleration. The accelerometers are located in the containment buildings and the switchyard block house. During the September 20, 2008, vibration event involving the Unit 1 main turbine, the seismic triggers did not activate and, as a result, the recording equipment of the seismic instrumentation system did not actuate. Based upon this information, CNP concluded the ground acceleration at the containment building was below 0.02g.

In addition to the above instrumentation, a number of peak acceleration or peak displacement recorders (approximately 10) are installed on selected structures, and in the aforementioned block house, to aid in the characterization of a seismic event. These instruments are similar to scratch gages that record the magnitude of vibration experienced during a seismic event. These instruments have not been examined since the September 20, 2008, failure of the Unit 1

main turbine. Since these recorders are not located in the turbine building and they do not have a means of recording the time of a disturbance, ~~Therefore,~~ they would not be expected to provide any characterization of vibration levels experienced during the Unit 1 main turbine vibration event. Additionally, since extensive inspections of the plant led to the conclusion that the turbine building structure was not degraded by the Unit 1 main turbine failure event (see response to Question 4), there is no reason to inspect these recorders outside of their normal inspection frequency.

In summary, vibration levels experienced in the control room, turbine building, and other structures were not measured or recorded during the September 20, 2008, failure of the Unit 1 main turbine. However, I&M has concluded that the ground acceleration experienced by equipment within the containment building did not exceed 0.02g.

**Question 2:**

**The vibration levels assumed in these locations during the safe shutdown earthquake (SSE).**

**CNP Input:**

As described in the CNP UFSAR, Section 2.5, a ground acceleration of 0.2g (acceleration equivalent to 20% of that due to the force of gravity) is assumed in the design of structures, systems, and components required to safely shut down the reactor, and for operability of engineered safety features systems, following an SSE. Other major structures are designed for a maximum horizontal ground acceleration of 10% of gravity, or 0.10g.

**Question 3:**

**In locations where the vibration levels during the September 2008 event exceeded the vibration levels assumed for SSE, the extent of piping, pipe supports, etc. replaced/repaired due to potential stress damage and the bases for not replacing other structures, systems, and components exposed to greater than SSE loading.**

**CNP Input:**

There is no evidence that vibration levels experienced by safety-related structures, systems, and components during the September 20, 2008, event exceeded the vibration levels assumed for the SSE.

**Question 4:**

**In locations where the vibration levels during the September 2008 event did not exceed the vibration levels assumed for SSE, the extent of measure taken to protect against spurious equipment operation and the bases for concluding the as-left configuration will not pose a public health hazard in event of a SSE.**

**CNP Input:**

Following the Unit 1 main turbine vibration event on September 20, 2008, an assessment team was assembled for the purpose of evaluating the turbine building for structural damage. This team performed extensive inspections of the turbine building structures and equipment, including visual examinations for signs of structural distress such as cracking, warping, bowing, spalling, and displacement of structural elements. Based upon the results of these inspections, I&M concluded that the structural elements of the turbine building were not degraded by the event.

The event resulted in significant damage to the main turbine rotors and bearings, turbine casings and hoods, and local damage to the concrete and grout of the main turbine foundation in areas that interface with the turbine hoods. Repairs to the main turbine and its foundation are in progress and will be completed prior to returning Unit 1 to service.

The spurious equipment operation that occurred during the event was directly attributable to the vibrations that occurred due to the main turbine failure. However, the equipment which spuriously operated is associated with the balance-of-plant systems and is not associated with functions that protect the public health and safety.

Therefore, the condition of plant structures, systems, and components will not pose a hazard to the public health and safety in the event of an SSE following the return to service of CNP Unit 1.